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# PRELIMINARY Health Assessment for

PASCO SANITARY LANDFILL  
PASCO, FRANKLIN COUNTY, WASHINGTON  
CERCLIS NO. WAD991281874

AUG 21 1990

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
Agency for Toxic Substances and Disease Registry

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## THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i) (7) (A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risks assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR has conducted this preliminary health assessment on the data in the site summary form. Additional health assessments may be conducted for this site as more information becomes available to ATSDR.

## SUMMARY

The Pasco Sanitary Landfill (PSL) is an active landfill located on 280 acres of land, 1.5 miles northeast of the city of Pasco, in Franklin County, Washington. This site is included on the National Priorities List. Historically, the landfill accepted municipal and industrial wastes. The industrial wastes were reportedly deposited in surveyed locations at the landfill from 1972 to 1974. Contamination has been detected in on-site groundwater monitoring wells. In the information reviewed by the Agency for Toxic Substances and Disease Registry, no evidence of contamination appears in any public or private domestic wells or irrigation wells in use downgradient of the site. However, the information is limited. The PSL is of potential public health concern. The site may pose a future health concern because of the potential for toxic substances to migrate through the groundwater to wells used as a potable water source.

## BACKGROUND

### A. SITE DESCRIPTION AND HISTORY

The Pasco Sanitary Landfill (PSL), an NPL site, is an active landfill located on 280 acres of land near the crossroads of Kahlotus Road and State Route 12, 1.5 miles northeast of the city of Pasco, in Franklin County, Washington (Appendix A). The landfill is surrounded by a combination of irrigated agricultural fields and rangeland. Immediately south of the landfill is a recycling facility, and 1,500 feet southeast is the Devries Dairy. An inhabited mobile home is located on-site approximately 100 feet from the gate. The site is not restricted.

The PSL, originally the Basin Disposal Company, was operated as an open burning dump from 1956 to 1971. Municipal wastes were dumped on the surface and periodically burned. In 1971, PSL was converted to a sanitary landfill. The Resource Recovery Corporation leased a portion of PSL in 1972 and operated it as a regional hazardous waste disposal site. The site accepted wastes until 1981; most hazardous wastes were accepted before 1975. More than 47,000 drums of various hazardous wastes were deposited in the leased portions of the landfill. Wastes known to be deposited include chlor-alkali sludges, paints, resins, herbicide manufacturing wastes, caustic chemicals, and empty pesticide containers. Before being buried, liquid wastes were evaporated to dryness in lined and unlined lagoons.

### B. SITE VISIT

A site visit was made by the Agency for Toxic Substances and Disease Registry (ATSDR) staff on March 13, 1989. Most of the landfill is not fenced or restricted. The main gate located in the southwest corner of the property is monitored, and there is reportedly no difficulty with trespassers.

The lift method is used in landfill operations. Currently, the weekly cover soil used at the site is native soil that has been spread with septic wastes before being excavated from the northern portion of the site. A gas monitoring system has been installed along the western boundary and at the top of the refuse pile. A variety of wildlife, including sea gulls and pheasants, was noted at the landfill. Reportedly, no deer or coyotes are in the area. A few trees were located along the road, and some weeds were observed in areas where active filling was not occurring. The remaining vegetation consists of crops in the nearby fields.

### C. COMMUNITY HEALTH CONCERNS

No concerns were expressed by citizens to local, State, or Federal agencies regarding the PSL. Residents should be kept informed about activities at the PSL to prevent concerns generated by incorrect and nonexistent information.

## DEMOGRAPHICS, LAND USE, AND NATURAL RESOURCE USE

The one mobile home trailer located on-site, is inhabited by a man who is not employed by PSL but who provides nighttime surveillance for the landfill and recycling facility. The nearest population center is a mobile home park located approximately 3,000 feet southwest of the site with approximately 36 occupied lots. These lots are all supplied with drinking water by the municipal water supply, which uses the Columbia River as its source. The city of Pasco extends to the west, beyond the trailer park. There was evidence of children living at the trailer park. The actual population of children in the area is unknown.

The site is surrounded by agricultural land with 18 irrigation wells within 1 mile. The land slopes with a 1% to 3% grade towards the west-southwest. The junction of the Snake River and the Columbia River is approximately 2.5 miles south of the PSL.

One potable water well is located on-site. 1987 samples indicated there was no contamination in this well. There are 12 domestic and commercial wells and 18 irrigation wells within 1 mile of the site.

Hunting was reportedly forbidden on-site, but was known to occur in fields adjacent to the landfill.

## ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

### A. ON-SITE CONTAMINATION

No surface water sampling was performed on-site because of lack of surface water. Surface soil sampling above the waste disposal areas was not done since the wastes were covered with 3 feet of uncontaminated soil, a polyvinyl chloride liner (PVC), and an additional 2 feet of soil. Although contamination would not likely migrate towards the surface, erosion could expose buried wastes. In addition, areas within the landfill boundaries not associated with the buried hazardous wastes may show some type of surface contamination.

Results of ambient air sampling on-site did not indicate that contaminants had been released into the air. Groundwater sampling from monitoring wells installed on-site revealed the presence of several compounds at levels above the U.S. Environmental Protection Agency's (EPA's) Maximum Contaminant Levels (MCLs) (see Table).

TABLE

CONTAMINANT	GROUNDWATER	
	CONCENTRATION RANGE (ppb)	MCL (ppb)
1,1-Dichloroethane	ND - 213	NA
1,1-Dichloroethylene	10 - 120	7
1,1,1-Trichloroethane	50 - 591	200
Trichloroethylene	52 - 684	5
Vinyl Chloride	ND - 8	2
Xylenes	ND - 600	440

ND - not detected

Data from July 1989 groundwater samples  
Pasco Sanitary Landfill, Pasco, WA

Subsurface soil samples taken during monitoring well construction revealed various organic and inorganic compounds not listed in the Table (for example, polynuclear aromatic hydrocarbons). The organic contamination was found almost exclusively in a shallow (10 to 30 feet below ground surface) soil sample collected from the former municipal waste disposal and burn area. These compounds have not been detected in the groundwater monitoring well samples.

#### B. OFF-SITE CONTAMINATION

Groundwater samples from a private well in the area indicated the presence of trichloroethylene (TCE) and 1,1-dichloroethane below concentrations of public health concern. The concentrations of contaminants detected in this well appear to be increasing. However, at this time, the contamination found cannot be attributed to the PSL site, since the site contamination is not completely characterized and since several private wells between the site and the contaminated well did not contain traces of these chemicals.

#### C. QUALITY ASSURANCE AND QUALITY CONTROL

In preparing this Preliminary Health Assessment, ATSDR relies on information provided in the referenced documents and assumes that adequate quality assurance and quality control measures were followed regarding chain-of-custody, laboratory procedures, and data reporting. The validity of the analysis and conclusions drawn for this Preliminary Health Assessment is determined by the availability and reliability of the referenced information.

#### D. PHYSICAL AND OTHER HAZARDS

The generation and migration of gas (methane and other gases commonly found at landfills) is a potential fire and explosion hazard. PSL has a gas monitoring system in place; no problems have been reported.

#### PATHWAYS ANALYSES

##### A. ENVIRONMENTAL PATHWAYS (FATE AND TRANSPORT)

Groundwater beneath the site occurs in two aquifers: 1) the Yakima Basalt and 2) the water table aquifer consisting of overlying sedimentary materials. Depth to the water table aquifer is approximately 55 feet. Groundwater movement is generally southwest toward the Columbia River with a gradient of 3.7 feet per 1,000 feet.

Annual precipitation averages less than 7 inches. The relatively mild winters and hot summers provide an evaporation potential of 60 inches per year. This suggests a low potential for leaching and migration of contaminants from the burial sites into the groundwater.

Surface soil above the buried wastes would not be expected to contain contamination because of the 3 feet of clean soil and a PVC liner containing the wastes. Erosion may expose buried wastes, however, and areas not associated with the buried wastes may contain surface soil contamination. Surface testing must be performed to eliminate soil as a pathway of concern. Air quality measurements have revealed no release of volatile compounds. There is no surface water on or near the site. At this time, groundwater is the primary environmental pathway of concern for the transport of contaminants.

##### B. HUMAN EXPOSURE PATHWAYS

From the information provided above, human exposure to air and surface water would not be expected to pose a public health threat. Since surface soil sampling has not been completed, it cannot be determined if contamination exists at a level of public health concern.

If surface soil contains contamination, the following human potential exposure pathways may exist:

- Direct ingestion
- Dermal absorption, ocular contact and/or reaction
- Inhalation of chemicals volatilized from soil
- Inhalation of reentrained dust
- Ingestion of inhaled contaminants removed from the lungs via the mucociliary tract

Exposure to contamination in the groundwater from PSL can potentially occur in the following ways:

- Direct ingestion of groundwater
- Inhalation of volatile compounds released during household use or irrigating
- Absorption through the skin while bathing or showering
- Consumption of plant life irrigated with contaminated water
- Consumption of animals that consume plant life irrigated with contaminated water

Currently, no off-site wells show evidence of contamination attributable to the site. Several private wells have shown low levels of organic and inorganic compounds below Federal drinking water standards.

There is no evidence of current exposure through ingestion of the plants directly or through ingestion of animals consuming the plants. Other exposure pathways will only be of concern if contaminants migrate or are shown to be migrating from the landfill site to wells used for potable water.

#### PUBLIC HEALTH IMPLICATIONS

If migration of contaminants directly attributable to the site were to reach private wells in the area, adverse health effects are possible. Some groundwater contaminant concentrations at the site presently exceed their EPA MCLs. Mechanisms such as soil adsorption and degradation may decrease the concentrations of these compounds by the time they reach potable or irrigation wells. Thus, health effects of potential concern could include acute effects and/or chronic effects. The amount of possible future exposure to contaminants from the site cannot be estimated.

Acute exposure to TCE, vinyl chloride, 1,1-DCE, 1,1-dichloroethane, 1,1,1-trichloroethane, and/or xylenes can produce central nervous system (CNS) depression (fatigue, confusion, incoordination, and the like). Several of the compounds can also produce respiratory, eye, or skin irritation. Violent or severe reactions such as vomiting, collapse, and kidney or liver damage occur at concentrations much higher than those found in the groundwater on-site, and are unlikely to occur. In the case of TCE, the drinking of ethanol can enhance any adverse effects. In addition, concurrent occupational or other exposures may increase the possibility of health effects in certain individuals.

Chronic effects from these compounds have been reported in occupational settings with inhalation of relatively high concentrations. Long-term ingestion of groundwater containing lower concentration levels can produce possible liver or kidney damage.



Vinyl chloride is a designated human carcinogen. Evidence from both animal studies and human epidemiologic studies indicates that vinyl chloride causes angiosarcoma, a rare liver cancer. Vinyl chloride is a biodegradation product of TCE, and concentrations may increase with time. Those who smoke are exposed to an additional 5 to 27 nanograms of vinyl chloride per cigarette.

Evidence from animal studies suggests that TCE and 1,1-dichloroethylene (1,1-DCE) may be carcinogenic in humans. TCE has been shown to be mutagenic in the Ames test and has produced liver tumors in mice. 1,1-DCE is considered weakly mutagenic and has produced tumors in rats exposed by inhalation, but not by ingestion. Direct evidence of carcinogenicity in humans has not been demonstrated for either compound.

At this time, none of the health effects mentioned above can be expected from exposure to chemicals from the site since no exposures are currently known. It is possible that future exposure may occur.

#### CONCLUSIONS

Based on information reviewed, ATSDR has concluded that this site is of potential public health concern because of the potential future risk to human health resulting from possible future exposure to hazardous substances. As noted in the previous sections, there is currently no evidence of human exposures to on-site contaminants. This assumption is based on the available data, which are currently incomplete. There are indications that exposure is possible if contaminants are in the surface soil or appear in the on-site drinking water well or migrate off-site to private drinking water or irrigation wells.

Though information provided to ATSDR did not indicate contamination of the on-site drinking water well, analysis of samples from on-site monitoring wells verifies on-site groundwater contamination. Movement of ground water contamination toward off-site drinking water wells cannot be verified because of a lack of off-site monitoring wells.

Surface soil in areas not associated with the buried hazardous wastes has not been tested for the presence of contamination.

As with all sanitary landfills, the possibility of migration, a fire, or explosion from methane gas buildup exists. Methane gas buildup in the soil zone might be dangerous during any subsurface investigations or remediation.

#### RECOMMENDATIONS

1. Sample, on a frequent basis, the potable water well on-site to monitor for the presence of contamination and to prevent exposure to the individual living on-site.

2. Monitor on-site and off-site groundwater through monitoring and private wells to track the advance of the contaminant plume. If contamination should appear in private wells, appropriate steps should be taken to prevent exposures that could produce adverse health effects.
3. Sample on-site surface soil in areas not covered with uncontaminated soil and a PVC liner. If surface soils are contaminated the site should be restricted by a fence and locked gate.
4. Maintain an appropriate gas monitoring system at the landfill. Institute appropriate preventive devices or procedures necessary to prevent a fire or explosion resulting from gas buildup, particularly during subsurface investigations or remediation.
5. When indicated by public health needs, and as resources permit, the evaluation of additional relevant health outcome data and community health concerns, if available, is recommended.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, the Pasco Sanitary Landfill site has been evaluated for appropriate follow-up with respect to health effects studies. Inasmuch as there is no extant documentation or indication in the information and data reviewed for this Preliminary Health Assessment that human exposure is currently occurring or has occurred in the past, this site is not being considered for follow-up health studies at this time. However, if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR will reevaluate this site for any indicated follow-up.

#### PREPARERS OF REPORT

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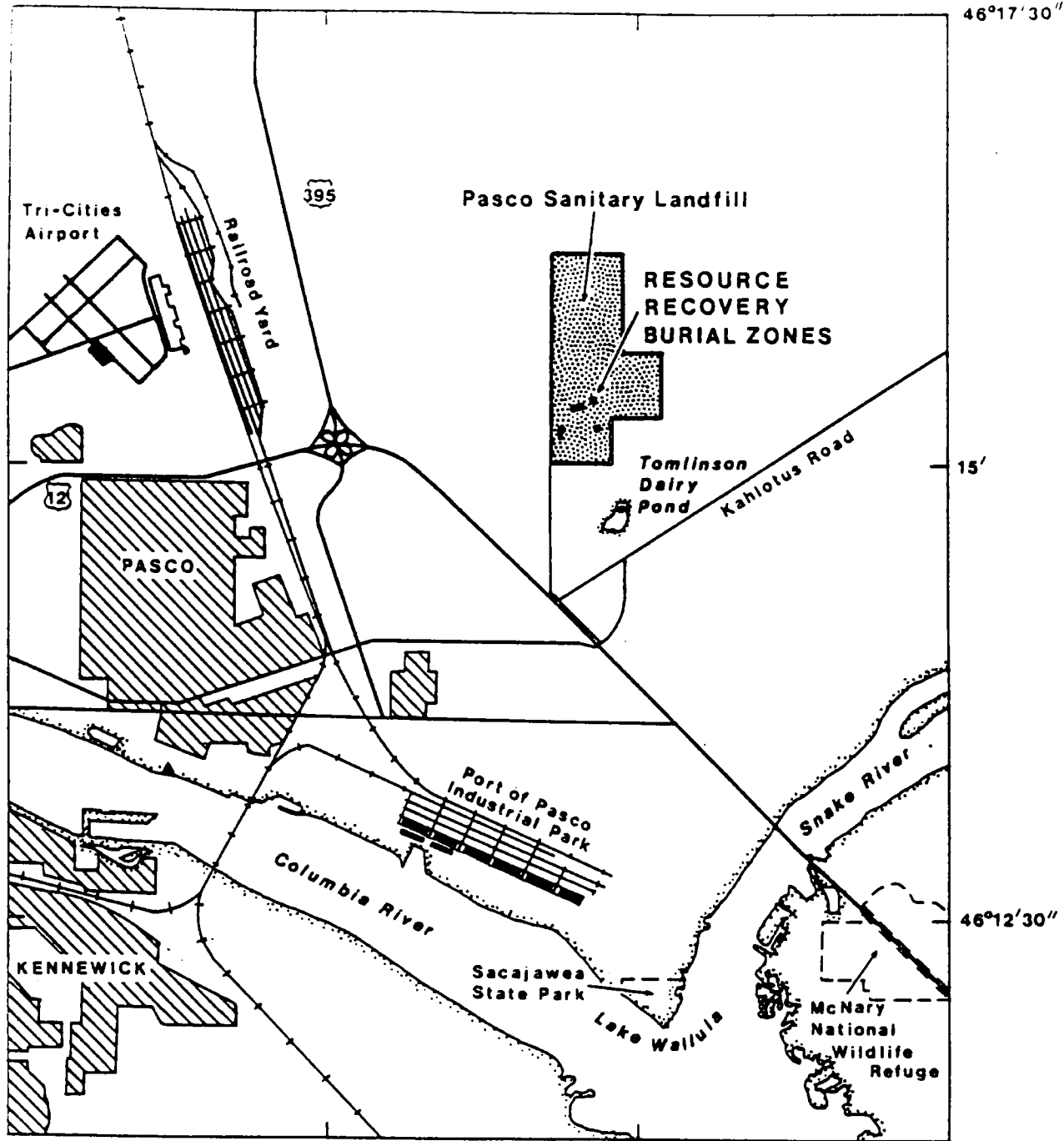
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#### REFERENCES

1. Ecology and Environment, Inc., Field Investigation Report for Pasco Sanitary Landfill/Resource Recovery Corporation, Pasco, Washington, TDD: F10-8701-04, Seattle, 1987.
2. Ecology and Environment, Inc., Final Report for Resource Recovery Corporation, Pasco, Washington, TDD R10-8410-14, Seattle, 1986.
3. Ecology and Environment, Inc., Preliminary Site Inspection Report of Resource Recovery Corporation, Pasco, Washington, TDD R10-8408-22, Seattle, 1985.
4. Ecology and Environment, Inc., Proposed Sampling Plan Resource Recovery Corporation, Pasco, Washington, TDD R10-8410-14, Seattle, 1985.
5. Harry G. Armstrong Aerospace Medical Research Laboratory, The Installation Restoration Program Toxicology Guide, Vol. 1, Arthur D. Little, Inc., Cambridge, 1985.
6. Technico and Enviro Services Co., Pasco Sanitary Landfill and the National Priorities List Update No. 7, Richland, WA, 1988.

## APPENDIX A

119°07'30" 5' 2'30" 119° 46°17'30"



# LEGEND



Areas of commercial and residential development



U.S. Route



City of Pasco municipal intake

0 1 2 MILES  
SCALE



ecology and environment, inc. SEATTLE, WA	
JOB # R10-8410-14	
Drawn by L. Jowise	Date 3-14-86

Vicinity map, Resource Recovery study area, Pasco, Washington.